

of vessels, by Adam-Kiewicz.—Hyalonema Siebold, Gray, by Küstermann.—Researches on the development of spermatozoa, by Neumann.—On amoeboid motions of the little nucleus-body, by Eimer. Part III. Studies on Rhizopoda, by F. E. Schulze.—The relation of ciliated epithelium of the abdominal cavity to the epithelium of the ovary, by Neumann.—Researches on the first signs of the eye-lens, by Mihalkowics.—Vertebral side and cerebral appendage, by the same.—Researches on the development of cross-striped muscles and nerves of Reptilia and Amphibia, by Calberla.—On the reproduction of Arcella vulgaris, by Bütschli.—Researches on the epithelium of the nose, by Brunn.—On the nerves of the gullet, by Goniaew.—Researches on the anatomy of the human throat, by Disse.—On the structure of the Najadeuxieme, by Posner.—Supplement: On the dental system of Keptilia, and its significance with regard to the genesis of the skeleton of the oral cavity, by O. Hertwig.—The above-mentioned researches of Greff and Schulze, which are in close relation with those made in England by Archer and Carter, treat of a class of the lower animals which only lately has attracted great attention; we therefore can hardly be astonished that in such treatises, descriptions and determinations of the different forms are in the majority, and that the particular course of life of single species remains at present still wrapped in considerable darkness. These neat little organisms consist of a very simple substance, which supports their existence (sarcode) and of a siliceous skeleton, which in some instances radiates outwardly in all directions, while in others it appears as a bag- or bottle-shaped shell, and is often adorned with relief-work well worthy of admiration. As indications seem to become more and more numerous that not only within the range of one species, but even in the development of one and the same individual animal, different forms occur, it is evident that the propagation and development of these organisms must remain difficult to understand, so long as these relative connections are not investigated. But thus much is already known, that even in the most distant localities the same forms may occur, and that the marine Radiolaria and Rhizopoda have near relations, or even identical forms, in fresh water. Besides division, the following phenomena seem to be connected with propagation: the phenomenon of conjugation (temporary union of two animals), of "encystification" (enclosing by a shell of the animal which is contracted into the shape of a ball), and of the formation of spores (production of interior germs, according to Bütschli).

ZOOLOGICAL STATIONS ABROAD

THE following letters from Dr. Mikluho-Maclay to Dr. Anton Dohrn, Director of the Zoological Station at Naples, have been forwarded to us for publication by Prof. Huxley. The first relates to a zoological station which Dr. Maclay has established in the Malay Archipelago, and the second to the general subject of zoological stations abroad.

"Dear Dohrn,—You are well aware that I share your views as to the great value of zoological stations to science, and you will not doubt that the account of the excellent results of the great establishment founded by you at Naples, which reached me by accident at Ternate in 1873 on my return from my first expedition to New Guinea, gave me great pleasure.

"It is now my turn to surprise you with the news of the establishment of a third (?)¹ zoological station at the

¹ I have not heard whether the station which you and I began at Messina in 1867-68 arrived at any high degree of development, or whether it shrank into a mere rudiment. My nomad life has prevented news of any other than yours at Naples from reaching me; for example, I do not know whether the station on the Black Sea, which I advocated at the meeting of Russian naturalists at Moscow in 1868, ever came into existence.

southernmost point of Asia, on 'Selat-Tebrau,' the strait which divides the island of Singapore from the Malay Peninsula.

"This new 'station' cannot, it is true, be so called in the same sense as yours at Naples. I have taken my own requirements and customary mode of life as the standard, and have arranged the building and its fittings in accordance with it.

"It will serve in the first place as a station and *Tampat Senang* (or place of rest) for myself; in my absence, and after my death, I wish to place it at the disposal of any student of nature who feels himself suited for my mode of life.

"My 'Tampat Senang' has the following advantages to offer:—

"A house consisting of two fairly large rooms, each provided with two verandahs (besides the necessary offices), surrounded on three sides by the waters of the straits, and on the fourth by the primeval forest.

"The house will be simply furnished, and will contain a small library, together with the most necessary articles for housekeeping.

"It possesses, moreover, two advantages which I consider to be of no small importance, namely, the command of a fine view, and very complete isolation.

"The use of this 'Tampat Senang' is open to any student of nature, without the slightest regard to nationality, provided only he be of the male sex (for I confess to a decided repugnance to all stages of development and differentiation of the genus 'blue stocking.') The presence of a woman as visitor, or as supplement of the one student of nature for whom the place affords room—for in this case a wife must be so regarded—is not forbidden; but since 'Tampat Senang' must remain true to its name and to my idea, no children can possibly be allowed there.

"I have purchased the piece of land on which the house is to stand, from H.H. the Maharajah of Johore. It is a small hill which forms a cape projecting into the Selat Tebrau. In my will I have made such provisions that my family, into whose hands it will pass, will be precluded from ever selling it, or allowing it to be used for any other purpose than as a station for scientific research; or from cutting down, or even thinning the primeval woods standing upon it; the utmost that will be allowed is the clearance of one or two footpaths through the wood, which is always to remain as a specimen of the untouched primeval forest. And although 'Tampat Senang' may be hereafter rebuilt in stone, and made more elegant or convenient, it is never to be enlarged, lest it should lose its character of an isolated abode for one student of nature.

"I lose no time in writing to you, although the ground is only just purchased and the house is not yet built, because I think the plan of establishing such outposts for students of nature in these parts of the world (the East Indian Archipelago, Australia, the islands in the Pacific Ocean, Japan, &c., &c.) likely to be very useful, and also because, on account of my present ailment (an injured foot), I have more leisure than usual.

"Hotels can never afford suitable places of study on account of the noise and confusion inseparable from them; nor can the hospitality of friends, however kindly it may be offered, supply all that the student of nature needs. Such unpretending stations as my future 'Tampat Senang,' where he can work in absolute quiet, neither disturbing others, nor suffering interruptions, without the need of asking favours or incurring obligations, will I think commend themselves to many persons interested in the advancement of science.

"A principal reason for my choice of Johore is the neighbourhood of Singapore, from which place 'Tampat Senang' can be reached in three or four hours. The advantages of this position are that all products of European industry can be easily procured; that by means of the frequent mails communication can be maintained with

all parts of the world ; that very fair libraries are accessible at Singapore and Batavia ; and that, at the latter place, scientific papers can be published in French, German, or Dutch, in the *Natuurkundig Tijdschrift*, while the *Journal of Eastern Asia*, of Singapore, publishes similar works in English.

"In the hope that you may be one of those who will make use of my 'Tampat Senang,' I remain, with all respect and friendship, "N. N. MIKLUHO-MACLAY

"28th April, 1875, Istana Johore,

"Res'dence of H.H. the Maharajah of Johore."

"In life, as in everything else, it is important to distinguish main points from secondary matter, and to act accordingly. Main points always remain main points, however important secondary objects may sometimes be. On account of this evidently correct view, I continue my journey into the interior of the Malayan peninsula, as my health is improving ; to-morrow I shall go to Pahang, and for the moment I give up building the 'Tampat Senang.' It is possible that I must try and find some other locality than Johore for this, because the Maharajah of Johore, after nearly two months' talking, in which time I had made out all the plans and had completely gone through all the details of the proposed building, has at last declared to me that he only could let me have that tract of land which I had chosen for the 'Tampat Senang' for a certain number of years, and that he must retain certain rights on the same. As all this does not agree with my plans, and as the locality is not of decisive importance, I shall, in case the Maharajah does not decide differently, construct my 'Tampat Senang' somewhere else.

"I consider the foundation of Zoological Stations in the tropics (however simply and poorly they may be fitted out, if they are otherwise quiet and comfortable places for work) as of the greatest importance for zoology and botany, since museum collections and preparations in spirits cannot afford sufficient material for investigation either with regard to quantity or quality.

"I have sent a proposal to the Society of Naturalist; at Batavia, to found a 'Tampat Senang' for naturalists in the Moluccas (at Amboina or at Ternate), and I intend to send similar proposals to scientific societies at Calcutta, and in Australia, and to some friends in Chile. If Russian Societies of Naturalists assist me I intend eventually to found a Zoological Station at the Sea of Ochotsk, or on the Pacific Ocean, myself.

"Zoological Stations in the Moluccas, in the Himalayan Mountains, in Tasmania, in the Fiji Islands, in Magellan's Straits, in Kamtschatka, &c., will yield not a few important results for all natural sciences. These stations will be particularly important for those naturalists who travel not only as tourists or as trade travellers of science, as it were, but who are engaged on some special work which requires large and fresh materials. Upon my return (which, however, is very uncertain at present) I will communicate to you my plans on the 'Tampat Senang' (the name seems to me to be quite appropriate) in detail. As it seems to me, they must be somewhat different from such Zoological Stations as your own at Naples, or we shall have to wait too long for their foundation. On my part I shall do all in my power for the carrying out of this idea, which nevertheless must remain a secondary (although important) object for myself.

"The day before yesterday I read in NATURE of May 6 of the official inauguration of your station at Naples, with much pleasure, and amongst the names I found those of several friends and acquaintances ; so that I am led to hope that the scientific world will be interested in the 'Tampat Senang' in other parts of the globe.

¹ It is a matter of course that what I expect from my future "Tampat Senang" cannot apply to others. Only mine shall remain true to its name, whether built at Johore, or at the Maclay coast in New Guinea.

"My kindest regards to yourself and all workers at the Zoological Station of Naples.

"N. N. MIKLUHO-MACLAY

"Istana, Johore, 9th May (June ?) 1875"

THE VATNA JÖKULL, ICELAND

THE following letter from Mr. W. L. Watts in reference to his journey across the Vatna Jökull has been forwarded to us by Mr. Logan Lobley. As we noted last week, this is the first time the Vatna Jökull has been crossed. The letter is dated "Grierestadir, by Jökull sá á fjöllum (Iceland), July 12, 1875."

"I am happy to say I have crossed the Vatna Jökull. It occupied between fifteen and sixteen days in bad weather. Eurísa is by no means the highest mountain in Iceland ; my aneroids registered 1,250 feet above Eurísa's height, subject to their correction upon my return to England.

"I feel certain that the Jökulls of Iceland are advancing at a considerable speed. The part of the Vatna Jökull, in the south of Iceland, called Breithamerker Jökull, has advanced about one mile and a half since the 10th of May last, and threatens to cut off all communication in that direction along the shore. I think, however, its rapid advance is not, as the natives believe, owing to volcanic heat in the Vatna Jökull, but that it is caused simply by the vast increase of frozen material upon its cloud and storm-wrapped heights. This accumulation above the height of 5,000 feet goes on both in summer and winter, and below for another thousand feet the waste during the summer months by no means equals the accumulation during the rest of the year. The glacier at the north point, at which descended, by Kistufell has advanced about twelve miles since the making of Olsen's map of 1844, diverting the course of the Jökull sá á fjöllum and causing it to rise about twelve miles from where it appears to do upon the map, i.e. about eleven miles N.E. of Kistufell and twelve N.N.W. of Kverker Jökull, instead of at the base of Kistufell. The grand old water-course it has vacated forms an excellent road for several miles. I feel sure Iceland must slowly but surely in course of time succumb to the same fate as befell the Greenland colonies.

"I am now about to proceed to the active volcanoes upon the north of Vatna Jökull. They are situated in the part of the Odaliters-braun called Dyngurjöllum, and as I expect in the Kverker Jökull. I shall have no time to hunt for any more this year, but if time will allow I shall visit the source of the great lava stream of Skaptar Jökull, a mountain I saw from the Vatna Jökull, situated in its S.W. limb, which I think may repay inspection ; and the lignite in the N.W. of Iceland.

"The destruction wrought by the eruptions of last winter is considerable. Several farms have been ruined by pumice and ash. Poor, dirty, interesting Iceland ! both fire and water, the latter in all its forms, appear to conspire against it."

ON AN IMPROVED OPTICAL ARRANGEMENT FOR AZIMUTHAL CONDENSING APPARATUS FOR LIGHTHOUSES

ORDINARY optical apparatus adapted for a lighthouse which has to illuminate the whole horizon, as at rock or insular stations, is unsuitable for stations situate on the coast line, or in narrow sounds, where the light has in some azimuths to be seen at great distances, in others at smaller, and where towards the land no light is wanted at all. The problem in such cases is to allocate the rays in the different azimuths in proportion to the distances and breadths of sea in which the light requires to be seen in those directions by the sailor. Before 1855 no attempt